Hall Ticket Number :										

R-15

Code: 7G251

III B.Tech. I Semester Supplementary Examinations June 2022

Electrical Machines-III

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

Marks

UNIT–I

1. a) Find the pitch factor for the winding of 36 slots, 4 poles, coil span 1 to 8.
   b) Explain how the harmonics in the generated EMF can be suppressed in synchronous machines.

OR

2. a) What are harmonics? Explain the causes for harmonics
   b) 3-Ph, Y connected alternator has following data:
   Voltage generated on O.C is 4000V at 50Hz, Speed is 500 rpm, stator slots/pole/ph is 3, conductors/slot is 12. Compute the no. of poles and useful flux/pole. Assume all conductors/ph to be connected in series and coil to be full pitched.

UNIT–II

3. With the help neat diagram, explain how OC and ZPF tests are conducted. Explain the procedure to find the regulation using ZPF method.

OR

4. a) Write a short note on armature winding terminology.
   b) A salient pole alternator has d-axis and q-axis reactance of 0.8pu and 0.5pu respectively. The effective resistance is 0.02pu. Compute percentage regulation when the generator is delivering rated load at 08 p.f lead.

UNIT–III

5. a) What is an infinite bus? Mention the conditions to be satisfied prior to synchronizing an alternator to infinite bus bar.
   b) A 10MVA 3-ph alternator has a reactance of 20%. Calculate the total synchronizing power of armature per mechanical degree of phase displacement when running in parallel on 10KV, 50Hz bus at 1500rpm.

OR

6. a) List the methods of synchronizing 3-Ph alternator to the infinite bus bar. Explain two bright and one dark lamp, synchroscope method with neat diagram.

UNIT–IV

7. a) Develop the mathematical expression of power developed by synchronous motor. Also derive the condition for maximum power developed.

OR

8. a) Explain the hunting of a synchronous machine. How this effect can be suppressed by damper windings.
   b) A 3 ph synchronous motor absorbing 60KW is connected in parallel with a factory load of 24oKWhaving a lagging p.f of 0.8. If the combined load has a p.f of 0.9, what is the value of the leading KVAR supplied by the motor and at what p.f is it working.

UNIT–V

9. Suggest and explain the modifications required to operate the DC series motor on AC supply.

OR

10. Explain the construction and operation of stepper motor with neat diagrams.

***

Hall Ticket Number :										

R-15

Code: 5G253

III B.Tech. I Semester Supplementary Examinations June 2022

Power Electronics

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

Marks

UNIT–I

1. a) With neat circuit diagram and waveforms explain the operation of RC firing circuit. 7M
   b) Explain about the Dynamic turn on Characteristics of SCR with wave forms 7M

OR

2. a) Draw and explain the turnoff characteristics of SCR. 7M
   b) Explain the triggering circuit suitable for firing angle control greater than 90° 7M

UNIT–II

3. Explain the two transistor analogy of an SCR. 14M

OR

4. a) Discuss dv/dt protection of SCR with snubber circuit. 7M
   b) Explain in detail gate protection of SCR with neat sketch 7M

UNIT–III

5. A single phase full converter is connected with R-load. The source voltage is 230 V 50 Hz. The average load current is 10A. For R=20 Ω find the firing angle. 14M

OR

6. Explain the operation of single phase full wave controlled rectifier with 'R' load with neat circuit diagram and necessary waveforms 14M

UNIT–IV

7. Explain the control strategies of a chopper operation. 14M

OR

8. A step down DC chopper has input voltage of a 230V with 10 Ohms load resistor connected, For duty cycle of 0.5. Calculate average value of output voltage. 14M

UNIT–V

9. Explain pulse width modulation techniques. 14M

OR

10. a) Explain the operation of 1-Φ bridge configuration of cyclo converter with resistive load. 7M
    b) Explain the operation of full wave AC voltage controller with RL load. 7M

***

Hall Ticket Number :										

R-15

Code: 5G254

III B.Tech. I Semester Supplementary Examinations June 2022

Electrical and Electronics Measurements

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

Marks

UNIT–I

1. a) Explain the basic characteristics of an instrument
   b) List and define different forces required to operate an instrument

OR

2. Explain in detail the different methods to produce Deflecting, Controlling forces

UNIT–II

3. a) Define the terms Power, Power Factor and Energy
   b) What is the purpose of copper shaded bands in an Energy Meter

OR

4. Explain the construction and working principle of single phase dynamometer type power factor meter. Derive the expression for torque

UNIT–III

5. Explain the construction and working principle of basic potentiometer circuit

OR

6. a) Classify the types of frequency meters
   b) Illustrate the working of Weston type frequency meter with diagram

UNIT–IV

7. a) Classify the resistances based on their values and number of terminals
   b) What are the different methods present to measure the medium and high valued resistances

OR

8. Determine the unknown inductance using Anderson's Bridge and list out the various advantages and disadvantages of the bridge with its phasor diagram

UNIT–V

9. a) List out the advantages of Digital meters over Analog meters
   b) How do you measure the voltage, current and time period using CRO

OR

10. Draw a neat labeled diagram of Cathode Ray Tube and explain its functioning

***